1) Demonstration of feasibility

Under demonstration of feasibility, it is important to determine not only whether the goals of education can be better satisfied when persons of limited skill, training, or experience are brought into the classroom to perform clearly defined tasks, but whether training inputs can be brought to them. Each aspect of these endeavors must in turn be carefully examined. Research must determine the characteristics of persons who can best perform these functions and of master teachers who can offer them leadership. Research must assess the impact of different pupil-teacher ratios in this attainment of education goals. Research must determine what years of on-the-job training, coupled with piped-in university or college experiences, are necessary for promotion to the next step.

2) Curriculum development

It is imperative that curriculum materials in a variety of media be developed so that the program benefits can be transferred to other settings and built into a general plan for education. Evaluation of curriculum materials, then, is an important research consideration that can be satisfied by field testing of materials in different settings.

3) Isolating problem areas

Any model as complicated and demanding as much interagency coordination as the New Careers model will undoubtedly encounter unanticipated obstacles. The research should chronicle these obstacles and the measures used to overcome or circumvent them. If the research proves unsuccessful (i.e., is unable to attain successfully the goals of education through the means presented here), all the difficulties that were encountered have to be evaluated. Only then will it be possible to determine whether the New Career approach was a good idea badly executed or an idea without merit. It should, however, be considered that unless alternative approaches to manpower for quality education are presented research in education manpower through such innovations as New Careers is much like space research: it is not a question of whether the goal can be attained, but rather, what are the means that need to be perfected in order to get the job done.

4) Development of leadership

Precisely the same amount of research concern should be invested in evaluating the training program for the development of leadership as is invested in the development of the training of New Careerists. The New Career approach will not lead to reduction of the

problems of education if it is dependent upon a handful of virtuosos. The recruitment, screening, and training strategies used in the development of leadership need to be carefully assessed as part of the research effort.

Summary

This paper has directed itself to the concern of educational manpower needs. What has been suggested here is that an entirely new approach to research and manpower be undertaken. A number of models must be developed that have an accountable potential to solve manpower needs, and they must be carefully evaluated in the context of education goals. A strategy for wholesale extension of programs of proven worth must be articulated, and its implementation should be evaluated in the overall research plan.

VIII. MANPOWER AND PUBLIC POLICY

Joseph Young

The intent of this symposium is to identify specific topics on areas for research in educational manpower over the next three to five years and to establish priorities among the topics or areas so identified.

Before becoming at all specific about any particular area of needed research, it might be useful to set forth a general proposition: priority ought to be given to those fundamental questions that bear on the fashioning of wise public policy in the field of educational manpower. It would be ill advised, of course, to consider the problem only in these terms. As in any area of educational research, resources ought to be available to the scholar or expert to pursue inquiry on questions he defines--however remote these may seem from the urgent policy questions of the day. However, there are pressing questions in this area which are faced by the Congress, college, and school officials, those concerned with mobilizing public opinion and influencing career choice. Hence, a substantial amount of the resources available ought to be directed at providing the data that will be of value in developing policy.

If there is any validity to this proposition, it follows that prior to adopting any categories, undertaking research--and certainly prior to collecting any data--we need (a) to establish what the major public policy questions in education are and then to determine the manpower implications of these policies; (b)to be in a position to provide the data, strategies, and counsel regarding manpower at the time that any new large-scale venture in education is being contemplated.

Let me offer an example of each of the two needs cited above. First, as to examining manpower implications of existing policy. It is clear that for almost ten years one of our objectives in education has been the development of increased interest in physics through the improvement of the physics taught in the high school. In implementing this policy, primary attention has been given to the improving of the curriculum. Substantial funds were devoted to the development of national curricula, to developing and making available training aids, laboratories, and laboratory equipment. Comparable efforts were undertaken in the related field of mathematics. Indeed, it would be hard to cite an endeavor in education that represented a more intense and sustained effort. Yet recent evidence suggests that the results in terms of enrollment and the development of interest in this field on the part of high school youngsters have been less than hoped for.

It would be nothing more than speculation to assert that the result would have been otherwise had we paid more attention to manpower in implementing this objective. On the other hand, we assume there would be general agreement that concern for manpower should be a significant aspect of an endeavor of this magnitude. This is not to say that there has been no attention given to manpower in improving physics in the secondary schools during this period. Far from it. The National Science Foundation, through the academic year institute and summer institute programs, carried out a retraining effort of substantial proportions. However, little attention has been given to directing fresh talent--fully prepared and of high quality--into the field of physics teaching in the high school. Nor--and this is more important--has sufficient attention been given to the number and quality of people needed to staff the teacher education programs in this field.

The example given above concerned the need for manpower knowledge when the improvement of existing arrangements in education was at issue. There is an even more compelling need for such information--from the manpower point of view--when wholly different educational approaches are being proposed, or when massive expansion of educational services is being considered for legislative action. Often little attention is given to the question of whether the number and quality of personnel are available to assure that the objectives of the program will be realized. Part of this is understandable. Those who propose such courses of action are often preoccupied chiefly with the high social purpose they intend. One suspects there may be another reason: little hard data are available to indicate what the manpower implications of a new policy might be.

The Child Development Specialist Act (3a) is a good example of the second type of need for manpower knowledge mentioned above. This bill calls for an annual expenditure of over half a billion dollars and over 55,000 specialists trained and working in the schools by the tenth year of the program. The bill is a sensible response to an important need in the schools; yet, its success is almost wholly dependent on whether we can find the number--and the quality--of the people needed. What knowledge can we bring to bear on such questions as: Is there a sufficient pool of manpower qualified to carry out this program on a nationwide scale? What effect is diversion of substantial amounts of talent to this function likely to have on other aspects of the educational enterprise? Does the creation of a new role like this represent the most efficient use of manpower in achieving the objectives of the program? What is an appropriate reward system to attract the kind of talent needed?

It is not appropriate here to spell out a way of looking at such problems or specify the kinds of information needed in such cases. However, it seems clear that such an approach would involve fairly precise role definitions; a translation of these role attributes into human attributes; the development of a set of standards, including estimates of the acceptable range of tolerance, so that sound judgments could be made when considering aspirants for these roles; estimates of the size of the available population that meets these standards; definition of the appropriate training for these roles; estimates of the existing capacity to carry out the training; estimates of the steps necessary to develop this capacity when it is not adequate; estimates of the "lead" time to produce a population of the requisite number and quality; determination of a reward system that is adequate to recruit the talent and to assure maximum productivity of the incumbents, etc.

Is there justification for so conscious and detailed a consideration of manpower needs? I think there is--particularly in fields where it is difficult or impossible to establish any measurable "payoff" and where there are few mechanisms of competition that would more "naturally" develop appropriate standards and reward systems. This is certainly true of the most "people-helping" functions, including education. Yet in these very fields, the quality of manpower is almost the sole factor that will determine the degree to which the objectives of the program or institution will be realized.

We have become sophisticated enough over the last few years to be comfortable with the idea of "costing it out" when a new venture in the public sector is being contemplated, even in the fields of education. We must now move to the point where we think just as naturally of the need to "manpower it out."

Those concerned with manpower research in education have a responsibility to establish more clearly that social programs have a manpower cost as well as a dollar cost. An acceptance of this reality will come about, however, only when we have developed ways to offer data that are precise enough to be convincing and really useful.

Manpower Categories

We need a much more imaginative and refined set of categories if we are to have data that will provide sensitive measures of the manpower needed and available. We still collect data in terms of "teacher," differentiating only by further classifications such as subject matter and sex. Yet to classify both the person with several courses in mathematics and the person with five years of preparation in the subject as "mathematics teacher" prevents any determination of the real supply of available teachers. Similarly, on the side of need, to bulk together the teacher of mathematics at the advanced placement level with one who is teaching business mathematics at the sophomore level is to hide rather than reveal anything about true manpower needs.

In any given instance, there may be a serious shortage in one subcategory and a surplus in another; by not differentiating, it is possible to overlook the shortage. The simple matter of a categorization scheme, then, may have an important bearing on developing policies and strategies in needed areas.

As more specialized needs develop and as more specialized preparation becomes possible, we are going to need a much more sophisticated classification system. Competence in dealing with culturally deprived youngsters, subject matter specialization in the elementary grades, the doctor of arts degree, partnership teaching arrangements are but a few of the new categories that must be accounted for on both the supply and the demand side.

An example may serve to show the need for more sensitive indicators in manpower research. For the last several years I have invited each of the colleges and universities in the country to nominate its outstanding senior in the field of mathematics or sciences. Two thousand of the twenty thousand seniors preparing to teach in these fields in the secondary schools were nominated in this program last year. Five hundred of these nominees filled out a brief questionaire concerning their career interests. Among other things, they were asked to indicate which of a dozen positions they would prefer to be holding fifteen years from now. Only nine of the five hundred expressed an interest in teaching mathematics or general science in the junior high schools. None of the two hundred fifty males indicated this as a choice! Our knowledge of manpower must increasingly reveal choices like this if we are to have a full grasp of what is at work in this field.

Manpower and Reward Systems

Nothing bearing on manpower policy in education is so important as a more complete understanding of the motivations of those who aspire to professional work and the kinds of rewards that can be employed appropriately in professional fields. Such an understanding is important both to insure that the requisite talent seeks entry into educational fields and that the potential of personnel in these fields is realized to the fullest. There is a growing body of theory and evidence bearing on these questions. Much of this has been developed by those concerned with career choice and those in the fields of industrial relations. Support should be given to efforts to apply these theories, this knowledge, to the problems of education and manpower.

Manpower and Quality in Education

No two words have been used more frequently than "quality" and "excellence" in discussions of educational policy--certainly in

the post-Sputnik era. Most people would agree that the quality of manpower is the main factor contributing to quality education. Yet, at the present time we have no index to guide us in determining whether we are improving in this respect. This aspect of manpower research needs serious consideration. With over a thousand institutions involved in the preparation of teachers and over twenty-five thousand units employing teachers, we have no way of taking stock in this important aspect of our educational endeavors. With the possibility of meeting our quantitative shortages in prospect, it is time to develop ways of establishing progress in the quality of manpower in education. There is, of course, too much disagreement on what constitutes the "good teacher" to attempt any categorization based on such a global definition. However, there is general agreement that certain attributes, or certain characteristics, have some bearing on the potential for quality teaching in the schools. Hence it would seem appropriate to develop on a national basis data which give an indication of the intellectual power and academic achievement of prospective teachers. Such gross indices should be developed in such a way as to permit comparison of the prospective teaching population with aspirants for other occupations; to permit examination of subpopulations within the total group to see where the specific needs are in the dimensions measured; to determine what, if any, are the effects of national fellowship programs in improving quality; to provide a bench mark against which to measure our efforts over time.

Organization for Manpower Research

At the present time we produce for the lower schools alone over one hundred thousand new teachers a year; we employ almost two million teachers and pay them something in excess of fifteen billion dollars. It is obvious that a goodly portion of our human and dollar resources are devoted to manpower in education. And there is every indication that more, rather than fewer, of these resources will be called for in the future. It is imperative that we use these resources wisely. This, in turn, raises questions about our capacity to deal with manpower problems in education: Are we adequately organized to provide the kind of manpower information needed in the making of policy? What agencies are involved? Is there overlap in function? Is enough manpower allocated to manpower research? How can we more directly involve the primary units of production (chiefly institutions of higher education) and the consuming units (school systems, higher education, industry) in the identification of needs, data collection, and other functions related to manpower research?

Clearly, we need to invest much more in research concerning manpower in education. The development of knowledge in this area is crucial to the fashioning of sound policy in education.

IX. CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS

The National Commission on Teacher Education and Professional Standards, taking into consideration both the symposium discussion and the participants' papers, notes the following conclusions:

- Educational manpower problems are intimately connected with the goals and purposes of education in our society. But establishment of such goals, though a prerequisite for effective manpower policies, is not properly a manpower concern.

- Despite the absence of clearly delineated educational policies and the diversity of educational standards and goals throughout the nation, well-planned, imaginative manpower research can produce valuable information of nationwide applicability and significance.

- NCTEPS agrees with the participants that educational manpower research should be strategically concentrated in a few major areas rather than scattered in hundreds of small, unrelated projects.

Implications

In addition to these basic points, the Commission finds certain implications contained in or arising from the material included in this report:

Standard research measures have failed to produce information sufficiently comprehensive to cope with the educational manpower crisis. In order, therefore, to make useful contributions, educational manpower researchers should not only use conventional means but also undertake unconventional programs coherently related to a central strategy. They must seek out projects that will yield information of immediate and practical value.

NCTEPS urges that manpower research projects deal forthrightly with substantive questions of basic educational policy. For example, measures of the quality of instructional personnel are fundamental tools for research and constitute problems to be solved rather than controversies to be avoided.

The more inclusive and well-balanced the research approach, the more conclusive will be its results. Single-minded concentration in a narrowly defined area or on a one-dimensional approach to a given problem is undesirable. It is furthermore important to consider the ultimate purpose of research results: dissemination and application in the schools.

Recommendations

In view of these conclusions and implications, NCTEPS recommends the concentration of educational manpower research in three areas, one of central importance and two others of only slightly lesser priority:

1) Experimentation with auxiliary staff, with the consequent redefinition of the role of the teacher, is already a national phenomenon. It is closely related to the changing and expanding functions of the schools. The symposium participants without dissent named this as a priority research area.

The problems and possibilities in staffing innovations are questions of national importance. What must be done by professionals and what can be done by less fully qualified assistants? What is the effect of a given staffing pattern on a given educational goal? How do emerging educational goals affect manpower needs? How do assignment practice, personal characteristics, and interpersonal relationships influence teacher productivity? To what extent should teachers have a voice in basic educational policy? How can excellence in teachers best be recognized? Well-planned research along these lines should yield results of interest and value to all school systems and all states.

The TEPS Commission therefore recommends that this area, the use of auxiliary staff and the changing role of the teacher, be assigned high priority in educational manpower research. It lends itself as a central theme eminently suitable for diverse, imaginative research of real value to American schools.

2) Career choice and recruitment strategy are a second priority area . In this critical field, little is known about such basic questions as what people will make the best teachers, whether these people choose teaching as a career, or how to attract the desired people into teaching. Analysis is needed of the personal, professional, and social factors that influence educational personnel.

Even less attention has been paid to specialized recruiting designed to attract such groups as a suitable percentage of the most gifted and promising students or teachers from minority groups. What will attract the top students? What will attract the Negro, Mexican-American, Puerto Rican, and Indian teachers so badly needed to help establish communications with their ethnic groups? What will attract personnel to areas of shortage--geographic, socioeconomic, and curricular?

How do present teacher-training programs affect students' career choice? What rewards do students anticipate and what attractions do they find in teaching? How accurate is their understanding of the teacher's job? Well-designed projects on differentiation of recruitment strategy and the characteristics desirable in a teacher should result in useful contributions to this area.

3) A study of the teacher reserve is the third area recommended by the TEPS Commission for priority attention. What proportion of qualified teachers not at present working in the field can (and should) be attracted back? What changes in working conditions, such as part-time openings or limited numbers of students, would encourage the return of desirable teachers? How mobile is the reserve? Where is it in relation to present teacher shortage? What kind of retraining would these "reservists" need? This unsounded and untapped pool could offer a significant supply of manpower.

Research Emphasis

Emphasis in all research projects should be relevant to basic problems, assessable results, and potential for practical application in the schools. New ideas and new approaches are called for, and particular attention should be paid to unconventional projects that promise substantial results. For example, NCTEPS suggests:

- A longitudinal case study (extending over a period of ten years or more), in a single school or school district, of the relation of a given staffing pattern to teacher productivity and educational quality.

- A large-scale, statistical study of the teacher reserve, supplemented by a series of interviews in depth to get at the human facts behind the numbers.

Establishment of demonstration models to test a given hypothesis on a scientific basis--for instance, establishment of intensive, small-group instruction in an inner city school, to be compared with a lecture-tutor system in another and the traditional classroom instruction in a third.

NCTEPS feels the best attack on the unprecedented problems of educational manpower today is to seek out new ideas and apply to them research procedures of a type and on a scale to produce substantial results.

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